

Characterisation and biodegradation of poly(lactic acid) blended with oil palm biomass and fertiliser for bioplastic fertiliser composites

ABSTRACT

This work presents a new technique for producing a slow-release fertiliser with bioplastic polymer coating. Poly(lactic acid) (PLA) was blended with granular NPK fertiliser and empty fruit bunch (EFB) fibres using extrusion technique. The polymer coatings were characterised using thermal gravimetric analyser (TGA) and diffraction scanning calorimetry (DSC). The PLA and EFB fibres complemented each other in terms of their thermal stability in the BpF composites. A homogenous BpF blend was observed under a scanning electron microscope (SEM). In biodegradation the percentages of weight loss for PLA/EFB/NPKC1 and PLA/EFB/NPKC2 were higher due to the presence of EFB fibres, which were 64.3% and 76.3%, respectively.

Keyword: Bioplastic; Oil palm biomass; Fertiliser; Composites; Leaching